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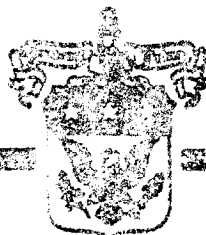
CONSUMABLE ITEM PLANNING FOR INDUSTRIAL PREPAREDNESS

BY

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CONSUMABLE ITEM PLANNING FOR INDUSTRIAL PREPAREDNESS

AN INDIVIDUAL STUDY PROJECT

by

Colonel Louis G. Mason
United States Army

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Project Adviser

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ABSTRACT

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The purpose of this paper is to examine not only the methodology employed in determining wartime material requirements planning and its relationship to the industrial base, but its underlying philosophy. The focus is on consumable items and is limited to the wholesale management of such items as practiced by the Defense Logistics Agency (DLA). Specific methodologies are presented which serve to better communicate requirements to industry during the critical periods of transition from peace to war. This paper is a result of personal interest generated during a 1988 study of Service mobilization and wartime requirements for consumable items. The major portion of that analysis is a product of this study. The wholesale logistics community has experienced a two edged problem with consumable planning: the perceived notion that the Armed Services do not know what they need; and the failure to plan with industry for the correct items. Yet, while there is truth to both notions, the wholesale community itself needs to initiate actions for internal improvements. The opportunity to not only refine requirements planning but improve business practices is real. The result will be reduced inventories, enhanced sustainability, and the potential to reduce costs and provide significant savings.

INTRODUCTION

The United States industrial base is unique in terms not only of its size, some 29,000 companies doing business with the Department of Defense in 1988, but in its diversity. Consisting as it does of not only the mega-giant Fortune 500, but mid and small size companies and the local "mom and pop" business operated out of an individual's garage, the industrial base is indeed a complex environment. Historically, industry and business have demonstrated, both in peace and war, the ability to respond to the military's needs. Unfortunately, the marriage of the military and industry has not always been a happy one. Many, if not most companies of any size, are frustrated with time-consuming procurement procedures, military specifications, packaging requirements, and the military's inability to forecast requirements in a consistent manner.

The purpose of this paper is to explain not only the methodology employed in determining wartime material requirements planning and its relationship to the industrial base, but its underlying philosophy. This paper will focus on consumable items and is limited to the wholesale management of such items as practiced by the Defense Logistics Agency

(DLA). Specific methodologies will be presented which would serve to better communicate requirements to industry during the critical periods of transition from peace to war.

The body of this paper is logically arranged to provide the reader a blueprint of the relationship of consumable items to Armed Service wartime planning and industry. First, a description of the relationship of consumables to surge and mobilization planning will be presented with emphasis on the changing scope of the consumable item inventory and proposed item management practices. Next, the Graduated Mobilization Response concept will be reviewed followed by a discussion of requirements planning. A detailed analysis of consumable item requirements will be shown stressing surge, commodity relationships, and dollar values, with particular attention given to Army requirements. Finally, the relationship of industrial planning and requirements will be assessed concluding with recommendations to improve consumable item management and the industry interface to meet wartime needs.

This paper is a result of personal interest generated during a 1988 study of Service mobilization and wartime requirements for consumable items. The major portion of that analysis is a product of this study. The wholesale logistics community has experienced a two edged problem with

consumable planning: the perceived notion that the Armed Services do not know what they need; and the failure to plan with industry for the correct items. Yet, while there is truth to both notions, the wholesale community itself needs to initiate actions for internal improvements. The opportunity to not only refine requirements planning but improve business practices is real. The result will be reduced inventories, enhanced sustainability, and the potential to reduce costs and provide significant savings.

CONSUMABLE ITEM PLANNING

Today's military continues to rely on the use of superior technology as an element of strategy. Weapon systems have become complex, requiring the industrial base to keep pace with technology and provide specialized products. The time required to produce major weapon systems perpetually increases as does the number of second and third tier contractors involved in the overall process. The problem is even more formidable when given an environment of decreasing military spending and changes in the geopolitical world. Consequently, the ability of the Armed Services to maintain a high state of weapon systems readiness and sustain these systems in combat is ever more important. These conditions pose a serious threat to national security and require that planning between the military and the industrial base be accomplished and continually refined to respond to a changing environment.

Industrial preparedness is the state of industry to produce essential materiel to support the national military objectives.¹ A strong industrial base, prepared to support the military under any condition, is in fact a deterrent to war. The scope of these conditions include both surge and

mobilization. Surge is defined as, "the accelerated production, maintenance, and repair of selected items and the expansion of logistics support services to meet contingencies short of a declared national emergency, utilizing existing facilities and equipment."² Surge can be considered to reflect increased production rates up to twice the normal rate. Whereas, mobilization "represents the conversion of the commercial economy to wartime production, presumably later and at higher output levels."³

Wartime sustainability of weapon systems is a product of effective planning including both the development of Service requirements and the identification of industrial sources of supply. Sustainability is a function of providing for and maintaining those levels of ready forces, materiel, and consumables necessary to support the effort.⁴ Those combat essential items consumed in the sustainment of weapon systems and personnel are key to success of the warfighter. Consumable items are those items of clothing, medicines, and supplies which lose their identity when used. They are normally low in cost and often have commercial applicability. For the most part, consumable items are managed by the DLA and its subordinate supply centers. These items are stocked in

peacetime based upon demand and economic order factors. The stockage of consumables should be viewed in two dimensions: breadth and depth. The breadth of items includes the number of individual lines stocked. The depth of the item is the quantity of that particular item stocked. With the potential of a smaller force structure in the future, the depth of items may diminish due to decreased weapon system densities, however, the breadth of the inventory may stay the same as the types of weapon systems remain constant.

While the future environment which the military must plan for war continues to evolve, the defense industrial base's capacity to meet the military's needs is diminishing. There is an alarming erosion of crucial industrial elements, coupled with a mushrooming dependence on foreign sources for critical materials, which is endangering our defense posture.⁵ There are a number of potential problem areas in industry that effects its ability to respond. The availability of raw materials and components from overseas is on the increase. For example, many key semiconductors for major weapon systems and munitions are produced solely in Japan. The availability of skilled workers for assembly operations are on the decline. Assembly tooling and the availability of workers to maintain increasingly sophisticated machinery impacts industry's ability to respond to military

needs.

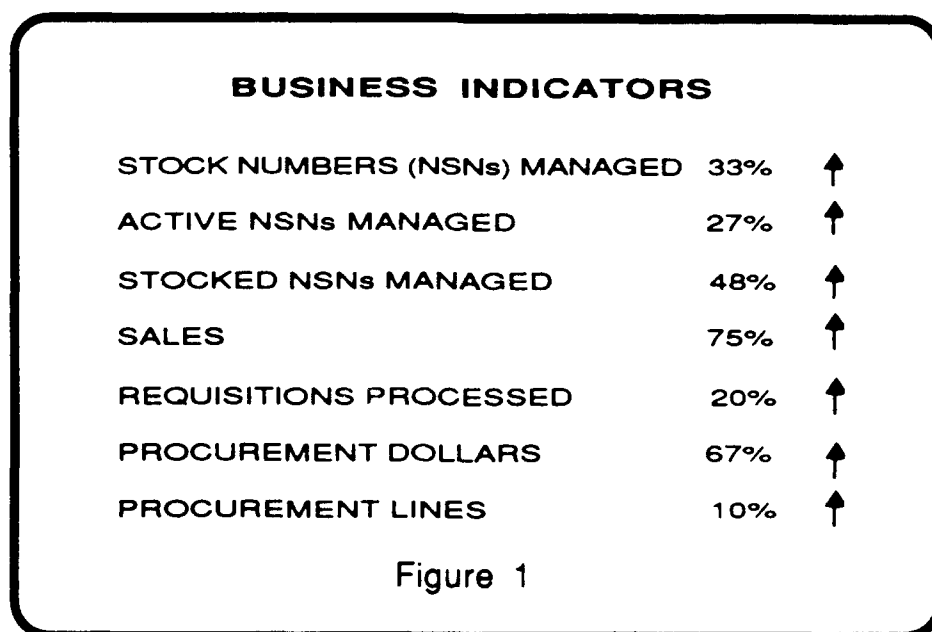
The small subcontractors, who are the primary source for consumables, are at the low level of technology and do not necessarily invest for the future. Failure to adopt state-of-the-art technologies and techniques could force small business into a noncompetitive role. For example, flexible manufacturing systems (which allows a manufacturer to produce a group of products from the same machinery) lower costs and allow customizing for varieties of component items. With these flexible machines, the contractor can integrate "just in time" practices to reduce inventory, transportation time, and capital investment.

A healthy civilian industrial base is critical to the capability of the defense industrial base to provide consumable items.⁶ The production base to support the military rests on the same foundations as the national ability to support the consumer market. The U.S. is losing both smokestack and high technology industrial capability.⁷ Today's healthy industry essential to national defense has the potential of losing competitiveness tomorrow.

Item Management in Transition

Probably the most significant impact on the management of

consumable items within the wholesale community was the 8 November 1990, Defense Management Review Decision (DMRD) 926. DMRD 926 requires the Armed Services to transfer to DLA approximately 981,000 consumable items, over a three year period, commencing in July 1991.⁸ This transfer will raise the consumable item inventory within DLA to approximately 3.9 million items. While the Armed Services have previously transferred consumables to DLA in lesser quantities, this transfer is unparalleled not only in size but scope. The nature of this transfer basically eliminates the management of consumables by the Armed Services' Inventory Control Points (ICPs). Figure 1 provides an analysis of the impact on business indicators for the DLA supply centers.



A thorough appraisal of these facts point to serious implications for

wholesale business areas. For example, the fact that a thirty-three percent increase in NSNs managed is indeed significant, the amount of stocked NSNs will directly affect all business areas. The most telling factor appears to be in cost analysis. Sales and procurement dollars indicate that the nature of the items being transferred are high dollar, critical parts, previously intensively managed by the Armed Services in support of specific Service peculiar weapon systems.⁹ The visibility that a Service ICP had over a specific NSN and its relationship to weapon system readiness presents a requirement for DLA to possibly alter inventory management practices. In fact, the possibility exists that the secondary item management activities within the Army wholesale community may disappear. Should this occur, the mission of formulation, tabulation, and consolidation of contingency, wartime and mobilization requirements data may fall by the wayside.

In addition, there exists serious problems in the identification of a specific consumable against a weapon system and its role in the readiness of that system. Some items, such as aircraft parts, may support more than thirty different systems, used by more than one Service, and not necessarily considered essential for readiness in all cases. This problem may limit the ability to fully reflect the contribution of consumable items

in materiel sustainability assessments and consequently creates obstacles in linking proposed consumable budgets to weapon systems.¹⁰

Numerous opportunities exist for improvements in consumable item requirements forecasting, inventory management and contract savings. Presently the DLA hardware centers employ hundreds of item managers to perform materiel management functions. In fact, twenty-two percent of the manpower effort of the DLA wholesale community is dedicated to materiel management.¹¹ Technical services, inventory accounting, and data processing constitute some of the primary components of inventory management. With the scope of managing a prospective three million consumables at the hardware centers alone, management efficiencies must be continually explored.

Commodity Oriented Procurement System

For numerous years the wholesale supply system has utilized a variety of automated information systems to accomplish specific business functions. Emphasis has been on inventory control, accounting, and requisition processing. However, little has been done to automate and improve the day-to-day paper transaction processes. To material managers, routine transactions such as purchase orders, invoices and

payments, always generate reams of paper, involve mailing, and manual integration with numerous automated systems. With today's technology, these areas are suitable for innovative improvements and present the potential for significant savings.

An innovative project has been initiated by DLA and is known as the Commodity Oriented Procurement System (COPS). This project was designed to improve efficiency of supply support and acquisition procedures by establishing teams to review high dollar items that will act as a "lead items" to group other related items into "family" groups. Once this is accomplished, the "family" group will be supplied through long-term Indefinite Delivery Contract (IDCs) in order to reduce procurement lead-time, inventory investment and item duplication.¹² This effort directly supports the challenges of DMRD 926. An example of the potential effect of COPS is illustrated by one small study. At a single hardware center, 1800 potential COPS items were identified in sixteen separate "family" groups. These items had a yearly dollar demand of \$12.7 million. Nearly forty percent or 750 items were identified as duplicate or redundant. Cancellation of those 750 items alone could result in a conservative \$180,000 cost avoidance in yearly item maintenance cost. In addition, sixteen long-term "family" group contracts could replace 2,850

individual buys over a three year period.¹³

Automated Management of Consumables

While COPS appears to be a common sense approach to business, the problem is an internal management challenge to alter the business culture of the item managers. COPS, in conjunction with automated technologies, offers the potential to multiply the savings effect. The primary technology to accomplish this endeavor is known as Electronic Data Interchange (EDI). EDI simply means the electronic transmission of business transactions from one computer to another or by means of an electronic mailbox. EDI basically integrates the business transactions between the wholesale supply system, the supplier or vendor, and the military customer. In 1979, the American National Standards Institute (ANSI) developed uniform standards for inter-industry EDI business transactions. These standards, known as ANSI X12, were developed to facilitate EDI relating to order placement and processing, shipment and receiving information, invoicing, and payment and cash application data.¹⁴ The format of this standard permits envelope type transmissions of standard data sets and data elements. The U.S. Government has accepted these standards and has incorporated the implementation of EDI as a

recent Defense Management Review initiative (DMR 941). In fact, DMR 941 estimates savings of \$548 million for the first five years of the program.¹⁵

With all the computer technology advances in recent years, today approximately four percent of industry utilizes EDI for business transactions. The wholesale supply system has made some elementary overtures into the EDI world. One of the first success stories is a program titled POPS (Paperless Ordering Placement System). POPS is a Defense General Supply Center (DGSC) initiative using their mainframe based system (known in the wholesale community as SAMMS - Standard Automated Material Management System) for placing orders electronically against Indefinite Delivery Contracts (IDCs).¹⁶ To illustrate how the system works, DGSC established an IDC with Kodak for the family group of hospital X-ray film. As requisitions are referred to DGSC for film, the mainframe recognizes the appropriate stock numbers, strips the orders out, and passes the orders to the vendor for direct delivery in an EDI format. This embryonic plunge into the EDI world resulted in a annual savings in excess of \$3.8 million.¹⁷

A second, more advanced EDI effort was initiated by the Defense

Personnel Supply Center (DPSC) for medical consumable non-stocked buys. With an original population of approximately fifty-two small business vendors, each buyer would process between 125 to 200 buys per day, often giving multiple quotes to the same vendors. To reduce this workload, a system known as SPEDE (SAMMS Procurement by Electronic Data Exchange) was fielded in 1988.¹⁸ As medical consumable requisitions are received in SAMMS, the orders are screened to ascertain if a Blanket Purchase Agreement (BPA) exists against an IDC. If the answer is yes, the order is passed directly to the SPEDE process. If a BPA doesn't exist, then the order is placed through another screen to assign possible sources of supply and then on to the SPEDE process. SPEDE, using a "mini" computer as a "gateway", automates random vendor selection and passes the orders electronically to vendors' personal computers as quotes for evaluation. The vendor receives the quote as electronic mail, submits a response within a twenty-four hour time period, and SPEDE analyzes the quotes for award. Awards are electronically passed to the vendor directing the him to ship the material to the appropriate location. An explanation to the other bidders as to why they did not receive the award is also sent. Invoices are electronically passed to the vendor and the finance office. SPEDE has tied forty-two vendors into the system, processing in excess of

6000 transactions monthly, and eliminated eighty-five to ninety-five percent of the buyers daily manual workload.¹⁹

EDI offers across-the-board initiatives for improvements in consumable item management. The wholesale community must make a concerted effort to create a cultural change in material management procedures. EDI is a tool which can enhance integrated material management. EDI can provide technologies to furnish item managers, buyers, technical, quality and catalog personnel an automated commerce system for rapid procurement of both standard and non-standard items. A commerce system such as this would include request for quote ordering, invoicing, and the employment of direct computerized networks to vendors' inventories to evaluate price, availability, substitutions, quality and shipment parameters. However, the main benefits from an aggressive implementation of EDI would be reduced inventories, surpassing transportation standards, increased direct vendor deliveries, and reevaluation of stockage criteria; all of these points equate to reduced item cost. The challenge for the Department of Defense (DOD) is to have a vision of the business practices of the future. As more electronic interface enters the business world, DOD should take a proactive role and set the pace for the rest of industry. DOD cannot allow the marketplace to

dictate the manner in which business transactions will occur.

Graduated Mobilization Response

In 1987, the Executive Branch developed a mobilization doctrine and system based on a graduated response to early warning.²⁰ This doctrine has become to be known as Graduated Mobilization Response (GMR). Of course, the industrial base desires the maximum amount of time possible to plan and execute a response to surge or mobilization requirements. In fact, the Armed Services always need more time to refine doctrine, plans, and readiness enhancements. But the philosophy of this system is to provide a range of political, economic, and military options that will assist in the management of a crisis. "These options are designed with two goals in mind: first, to improve deterrence and avoid war; and second, to prepare for war should it come."²¹

GMR can be best considered a philosophy. It requires coordinating, integrating, and making appropriate responsive action. While it recognizes the strength of the American industrial base to respond in a crisis, it must be remembered that the industrial world is an increasingly fragile environment with greater reliance on technology, scarce raw materials, second and third tier contractors and an untrained labor force

to respond to surge. GMR considers the element of time and the need to define requirements. However, GMR is focused on moving the moment of decision to the left, as far as possible, on the continuum of conflict.²²

The relationship between GMR and consumable item management is simple: whatever actions can be undertaken early in the deliberate planning process will help prevent chaos in subsequent mobilization stages. Consequently, mobilization objectives have to be tied to requirements.²³ The Armed Services derive their requirements for consumables from scenario based plans as directed by the Defense Guidance. Presently, there are five "base case" plans which are assessed as a global reaction to war, corresponding to the five warfighting Unified CINCs (EUCOM, CENTCOM, SOUTHCOM, PACOM, and LANTCOM). As will be subsequently discussed, these plans attempt to layout consumable requirements from mobilization to the D+180 timeframe. However, consumable requirements are not incorporated into planning as a time-phased GMR nor an industrial readiness plan. A full action plan would have requirements not starting at D-day, but providing a D minus six to eighteen month window.

To plan effectively for GMR, consumable item management must plan to "ramp-up" production rather than rely on stockpiles of defense

materiel. Trends in the industrial marketplace are changing. Industry's ability to adapt to change, a reduction in dependence on direct labor, strategic relationships becoming commonplace, and the fact that quality improvement has become the major driver in the manufacturing process are but a few of these changes.²⁴ Industry is indeed a partner within the GMR process and should be nurtured by DOD.

Requirements Analysis

Consumable items are layered in basically three levels by the Armed Services: in-unit stocks, retail stocks, and wholesale logistics stocks.²⁵ These three layers could be viewed respectively as tactical, operational, and strategic stocks. Both tactical and operational stocks are funded and held by the Armed Services within their retail environment; strategic consumables are for the most part wholesale assets funded and stocked by DLA. It is indeed difficult to forecast each Service's requirements for consumables with corresponding methodologies as each has their own distinct missions and tailored means for combat service support. Peacetime consumables are forecasted on a demand philosophy and are purchased from the wholesale stock fund system on a "pull" basis by the Armed Services. Combat stockages vary at the tactical and operational

levels but are designed to provide up to sixty days of supply (DOS).

Forecasting

Forecasting wartime consumable requirements is complex and is in no way an exact science. Wartime needs are not computed to improve an organization's readiness but to sustain that organization during combat operations. Sustainability is defined as "the ability to maintain the necessary level and duration of operational activity to achieve military objectives."²⁶ Defense guidance requires the commander (CINC) to develop needs based upon his concept of operations and reflect the expected duration and intensity of conflict and forces to be employed. These requirements will begin on M-Day (mobilization day) and be time phased.²⁷ Figure 2 summarizes which classes of supply must be planned by the Armed Services in a time phased manner. These combat essential requirements are known as Prepositioned War Reserve (PWR) stocks and are to be funded and stocked by the Armed Services to support forces during the initial stages (M-Day to D+60) of a scenario. The concept is to "push" consumables into the logistics pipeline in the right quantity to be available at the right time. It is important to note that this guidance requires only the Army and Marines to develop time phased wartime

RETAIL COMMUNITY MATERIEL PLANNING GUIDANCE				
CLASS OF SUPPLY	ARMY	NAVY	AIR FORCE	MARINES
I (FOOD)	X	X	X	X
II (CLOTHING)	X			X
III (POL)	X	X	X	X
IV (CONSTRUCTION)	X			X
V (AMMO)	X	X	X	X
VII (END ITEMS)	X	X	X	X
VIII (MEDICAL)	X	X	X	X
IX (PARTS)	X			X

Figure 2

requirements for all consumables (Classes I, II, IV, VIII, and IX). The explanation for this point is that both the Air Force and the Navy have organizational consumable packages designed to meet the first sixty days of war, whereas the Army and the Marine organizational packages expire at the thirty day point.²⁸

All Armed Services forecast consumables known as Other War Reserve (OWR) stocks. OWR is funded and stocked by the wholesale system to support the scenario during the interval after PWR stocks are exhausted and before the industrial production capacity is available to sustain the requirements, normally during the period of D+31 to D+180.²⁹ The point in time at which the rate of production on an item available for consumption

equals the rate that the item is required by the user is known as P-Day.³⁰

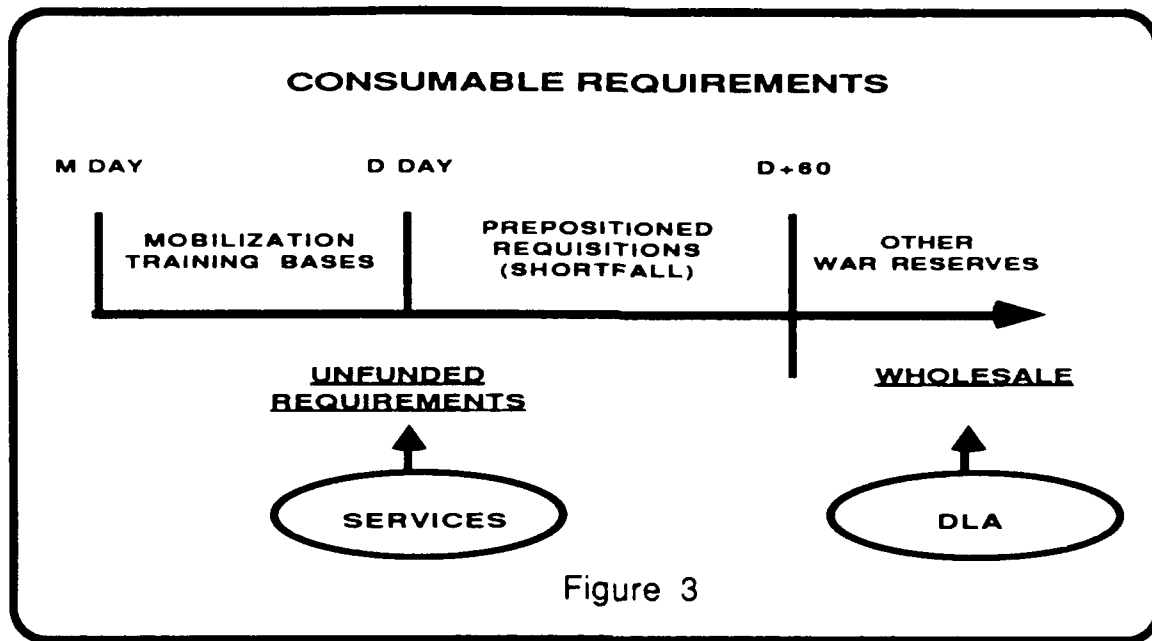


Figure 3

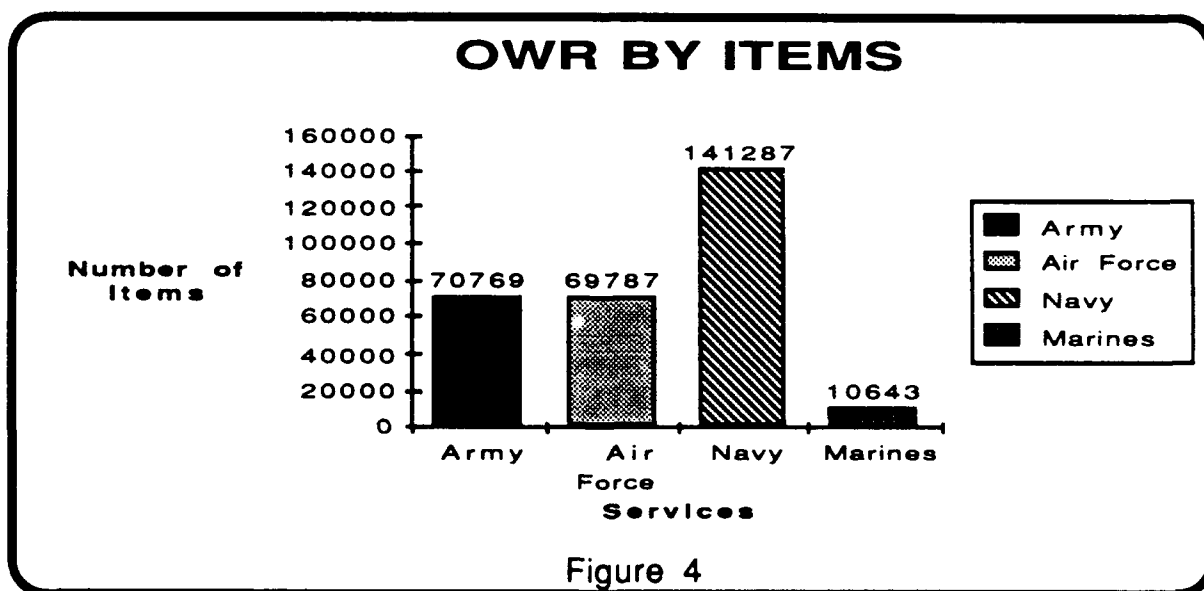
However, the problem of unfunded PWR and OWR items presents the planning challenge. Figure 3 portrays this concept.

Consumable Requirements

The Armed Services pass both their PWR and OWR consumable needs to the wholesale community annually via tape. This tape is entered into DLA's Standard Automated Material Management System (SAMMS), which handles all supply transactions for consumables (less medical). Using the Document Identifier Code (DIC) "DME" the Armed Services indicate PWR requirements, including required, on hand, and dollar value. DIC "DMA" furnishes the OWR requirements in a similar format. This data is received

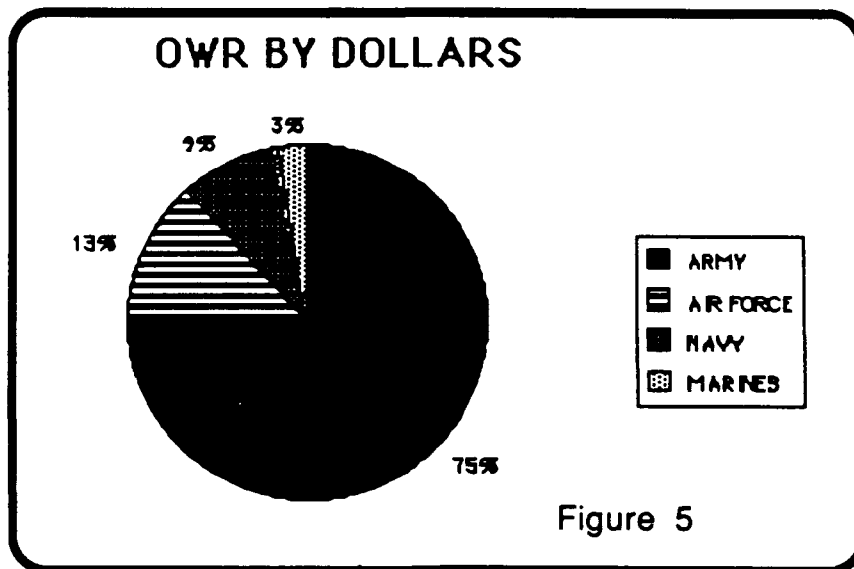
by each DLA supply center and becomes the basis for the centers' Integrated Materiel Managers (IMM) to program funds and purchase or retain excess materiel to support OWR needs. As the Armed Services are responsible for programming funds for PWR support and ensuring that sufficient PWR stocks are on-hand to support combat needs as prescribed by Defense guidance, the IMM presently does not include DIC "DME" items into planning. The Armed Services' medical consumables (Class VIII) are consolidated in a separate automated model and time phased accordingly. The scope of this problem will be explored in subsequent discussion.

For Fiscal Year 1989, DLA received from the Armed Services approximately 248,000 individual OWR stock numbered requirements, valued in excess of \$7.7 billion. Figure 4 shows a breakout by service for



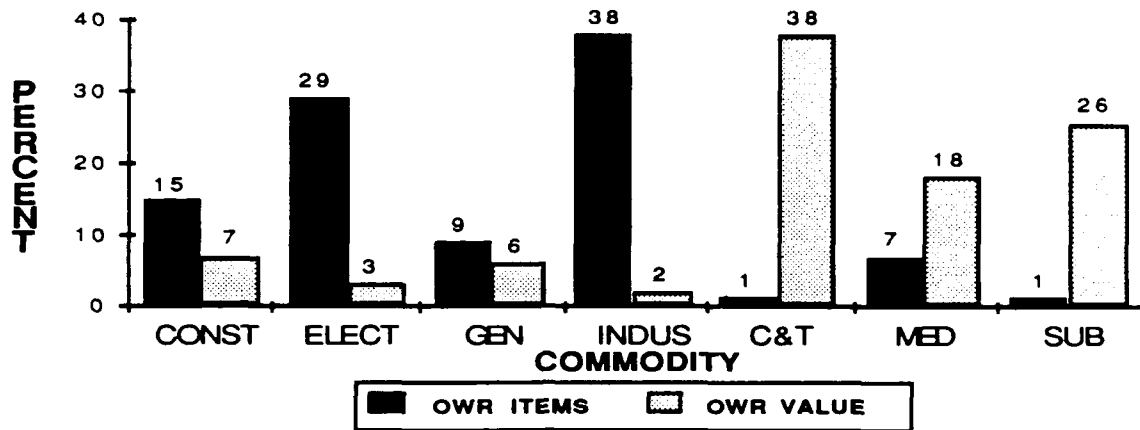
OWR consumables. While the total for figure 4 is in excess of 292,000 items, the difference from the 248,000 is due to duplicate items.

Although the Army's OWR requirements are only twenty-four percent of the breadth of the items, the value of the Army's needs constitutes seventy-five percent (figure 5).



After DLA adjusts the gross OWR requirement by subtracting on-hand war reserves and projected assets, the net result of approximately 175,000 stock numbered items, valued at almost \$5.5 billion, formulates the OWR shortfall.³¹ Figure 6 compares the percentage of items against the dollar value of this shortfall. The interesting fact is that hardware center items (construction, electronics, general and industrial) account for the majority of the requirements. The personnel items (medical, subsistence (combat rations only), and clothing and textile) would be

OWR ITEMS VERSUS VALUE



CATEGORY	VALUE	ITEMS
HARDWARE	18%	91%
PERSONNEL	82%	9%

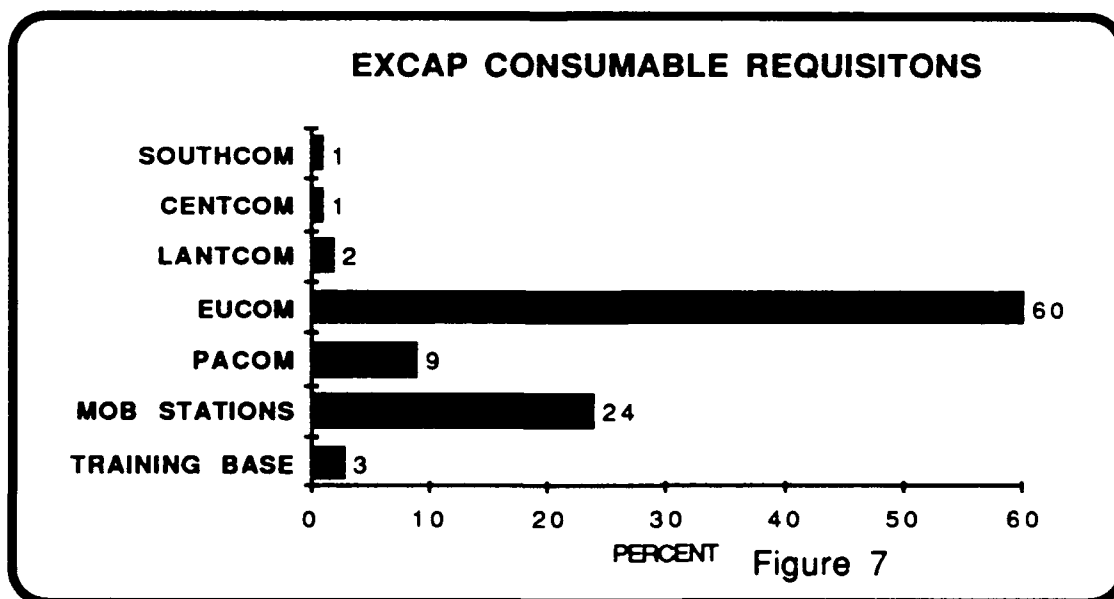
Figure 6

considered the "big ticket" items (eighty-two percent of the dollars). Of interest is that fact that chemical protective clothing (nine stock numbers) accounts for seventeen percent of the entire OWR dollar requirement. To the logistics planner, prudent investments in combat essential hardware consumables could result in significant increased sustainability at the strategic level.

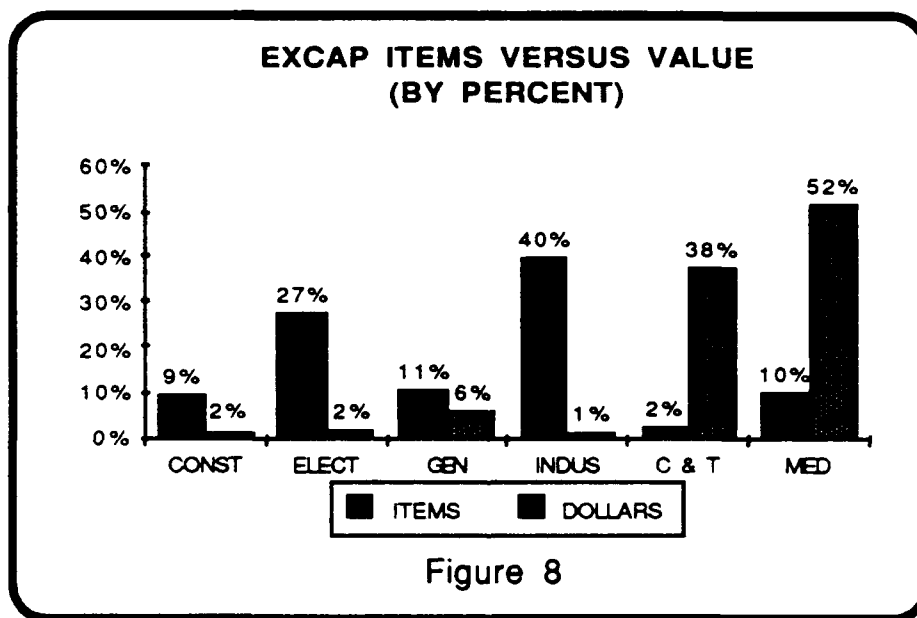
Army Exercise Capability System

To provide the ability to test known Army consumable requirements

against the wholesale system, the Army Materiel Command has implemented the Exercise Capability (EXCAP) System. EXCAP requisitions are constituted from actual base case war plans and reflect the real wartime requirements for the Army's retail (operational) shortfall needs. They include training base, mobilization station and theater requirements for both Prepositioned War Reserves and Preplanned Supply Support Packages (low dollar value "pipeline stuffers"). The program gives the logistics community the ability to determine support requirements, check automated procedures, and forecast procurement, supply and transportation surge work load.³² There are approximately 1.3 million requisitions within the program; 548,000 requisitions are for combat essential consumable items (less subsistence) managed by DLA.



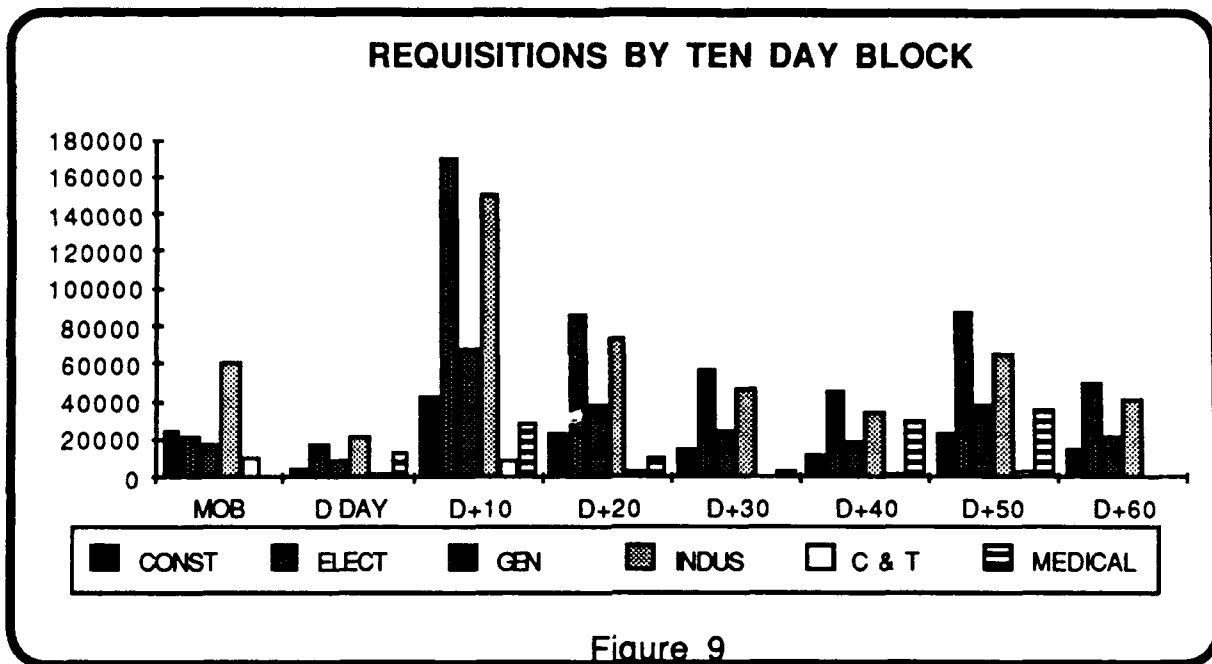
An analysis of 1989 EXCAP data for consumable items provides the wholesale community a clear picture of the shortfall for the first sixty days of a global war scenario. Figure 7 depicts the apportionment by theater, mobilization stations, and training bases for the 548,465 time-phased requisitions (a total of 25,197 consumable items) within the program. Figure 8 compares the percentage of items and value by DLA supply center. Once again, this illustrates that medical and clothing and textile (C&T) items constitute the majority of the dollar requirement



(approximately ninety percent).

When the EXCAP requisitions are viewed by required delivery date to the port of embarkation (the CONUS terminal arrival date - CTAD), a graphic depiction of surge appears. Figure 9 views these requirements by ten day windows, including mobilization requisitions. The in-theater

required delivery date is calculated by adding fifteen days for transportation to the CTAD. The distinct increase in requirements occurring during the D+10 to D+19 period is caused by the fact that the in-



theater retail (tactical) systems thirty day combat stockage will require replenishment. Additionally, if the EXCAP requisitions are viewed by tonnage and known storage locations, a depot surge illustration will result.

The real value of the EXCAP System to the wholesale logistics planner is its flexibility to be viewed by time, theater, commodity, value, and tonnage. Consequently, the program could be subdivided to plan for specific items, for a given theater, or any point during the initial days of the scenario. Additional reverse planning would allow contracting

planners to pass to industry specific essential needs to sustain the retail community; this type of planning presently is not conducted and is a major problem area within the logistics arena.

Industrial Preparedness Planning

The ability for industry to respond to increased surge and mobilization requirements is an area that requires extensive planning. The concept of the Industrial Preparedness Program (IPP) is to provide an orderly and effective transition of the industrial base from a commercial peacetime environment to an emergency support role with minimum delay or disruption.³³ IPP seeks to achieve a sustained state of readiness to meet various contingencies.³⁴ After the Armed Services compute their detailed, time-phased requirements for support of operational plans, the wholesale community initiates interface with industry to locate the industrial capacity, negotiate emergency production plans, register the planned producers, and perform other related actions with industrial management. Participation in the IPP process in most cases is on a voluntary basis, less producers of materiel where the Government has contractual rights. A company's agreement to participate in the IPP indicates a willingness to provide information about production

capacities, plant characteristics, and certain other required data.³⁵

IPP planning for consumables is the responsibility of the DLA. Each of its five supply centers works with industry to plan for known requirements. DLA's present planning efforts focus on global requirements and incorporate only OWR data. Given the assumption that a protracted global conflict is the worse case scenario, to formulate the total IPP requirements for a given item, DLA simply takes the six months OWR data and extends the monthly requirements out for a two year period at the D+180 quantity. When given an item for planning, a company can see the gross desired delivery dates for an item, by month, from M-day out for two years. Specific regional operational plans are not forecasted individually.

Given the fact that for the past three years DLA has had approximately 175,000 consumable items presented for IPP planning, a method had to be created to prioritize the workload. To focus planning on items which are critical to mobilization and which sound planning can substantially reduce the uncertainty of their availability, the DLA Operation Research and Economic Analysis Office developed the Item Selection Indicator (ISI). The ISI is a multi-attribute software indicator that provides an overall relative "goodness" measure by considering seven

distinct item characteristics: number of weapon systems supported, application to the Commanders-in-Chief Critical Items List (CINC CIL), weapons system criticality, lead time, essentiality code (ESS), mobilization demand ratio, and mobilization demand value.³⁶ These characteristics represent the criticality of an item and its uncertainty of availability. Figure 10 illustrates the ISI and depicts the respective

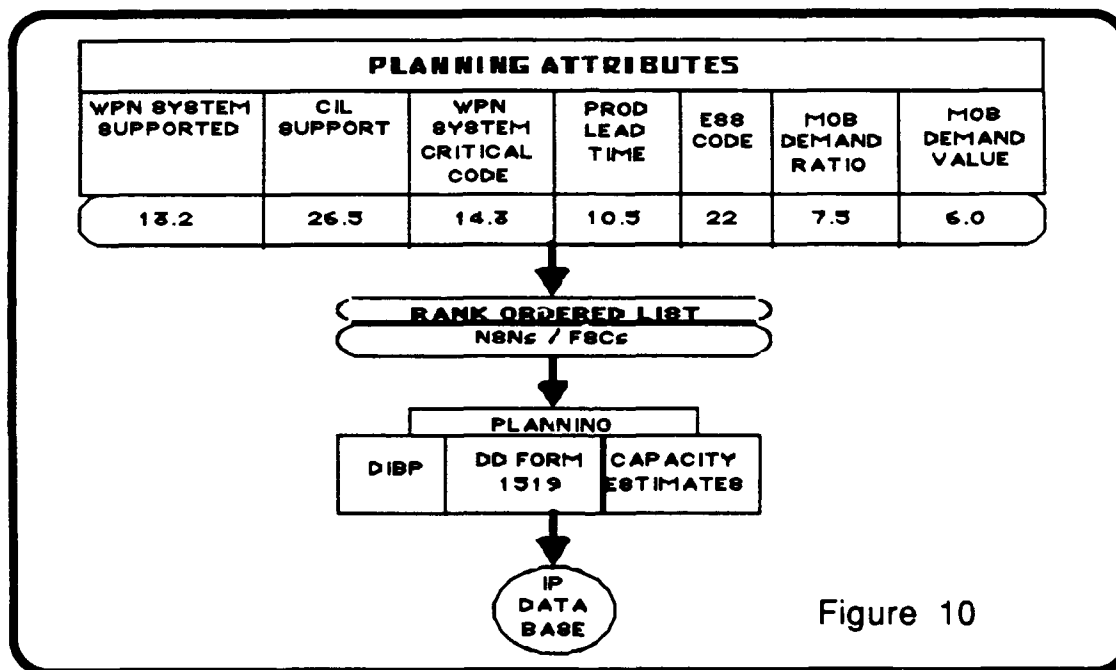


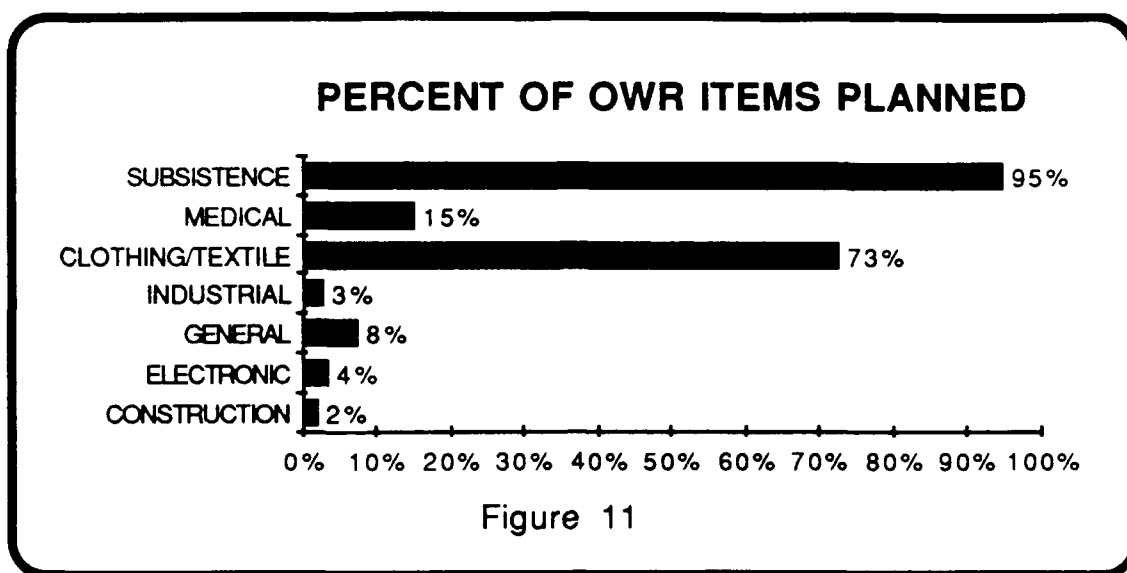
Figure 10

weights given to each attribute. After a rank ordered list is produced by stock number and supply class, the items are passed to the supply centers for planning. Each item is planned using Direct Industrial Base Planning (DIBP) production planning methods, manually completing the DOD Industrial Preparedness Program Production Planning Schedule (DD Form 1519), and performing internal plant capacity estimates. The ultimate

product is the industrial preparedness data base.

The heavy weight assigned in the ISI for CINC CIL items is important because of the emphasis on providing support to the weapon systems that the various Commanders-in-Chief have designated as being critical to their war fighting capabilities. All the CINC CILs are consolidated at the Joint Chief of Staff level and a list of approximately fifty weapon systems, in order of criticality, is prepared on an annual basis.

During 1989, approximately 12,000 of the 170,000 DLA managed OWR items presented for IPP planning were planned and entered into the industrial preparedness data base. This 12,000 will receive periodic reviews but will not require new planning for six years. DLA personnel dedicated to IPP planning (Civil Service 1150 series employees) include a total of forty-five people at the five service centers and fifty-one within the Defense Contracting Command. However, in 1989, only fifty-nine man-years were devoted to IPP planning for the DLA items. Figure 11 depicts, by commodity, the percentages of items planned. With the hardware items constituting ninety-one percent of the OWR population requiring planning, significant planning resources need to be dedicated to make any substantial progress in this arena.



IPP must work in harmony with the GMR philosophy. IPP should stimulate GMR preparations, at the national level, and incorporate GMR considerations in its dealing with business.³⁷ Since business responds to orders, the GMR link should be established by including surge and mobilization requirements into existing contracts, thereby pre-coordinating surge and production measures. "The point men for putting GMR into the industrial lexicon have to be the program managers, government contracting officers, plant representatives, and industrial planners who deal regularly with, and are familiar to, industry."³⁸

The ISI, with possible refinements, could provide further assistance to industrial planning. With the addition of a front-end automated screen, non-war reserve needs could be integrated into the planning process. This

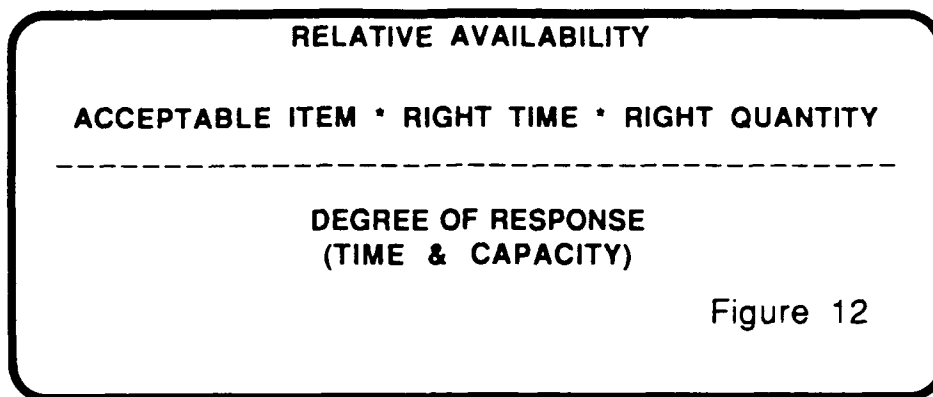
action would be a step toward earmarking items, not previously recognized as requirements, where the production base would cause problems in the event of war. The screening process could be updated by feedback from industry planning and be kept current as to industry's ability to support various classes of supply.

Opportunities for System Improvement

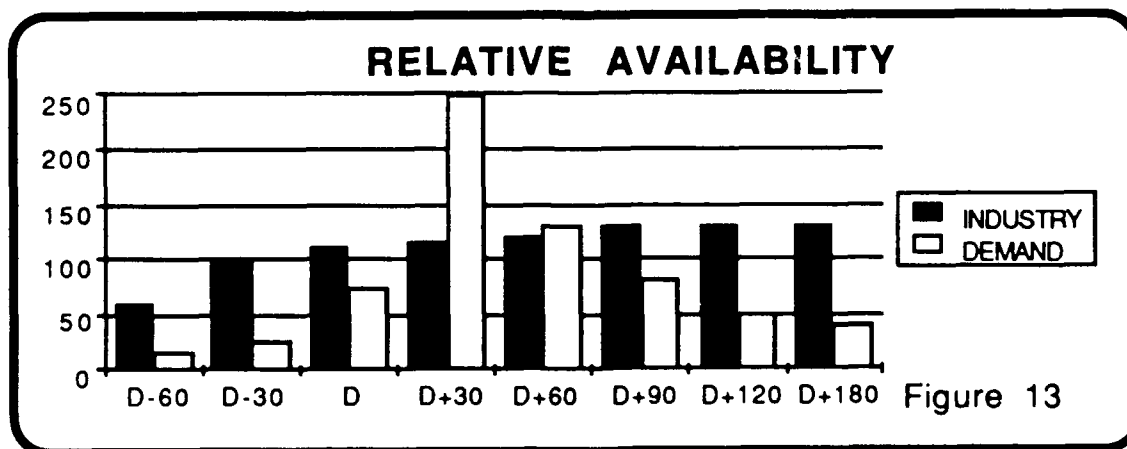
The wholesale community has the mission to provide the Armed Services the required consumable items needed for readiness and sustainment. The population of factories and vendors within the industrial sector who qualify to meet these needs is multitudinous and poses tremendous contracting challenges. In addition, a vast amount of consumables, or at least suitable substitutes, are either directly available on the commercial market or the production base could be considered "warm."

Relative Availability

If industry has the time and capacity to provide an acceptable item, at the right time, in the right quantity to meet requirements, then the item could be considered relatively available (Figure 12).

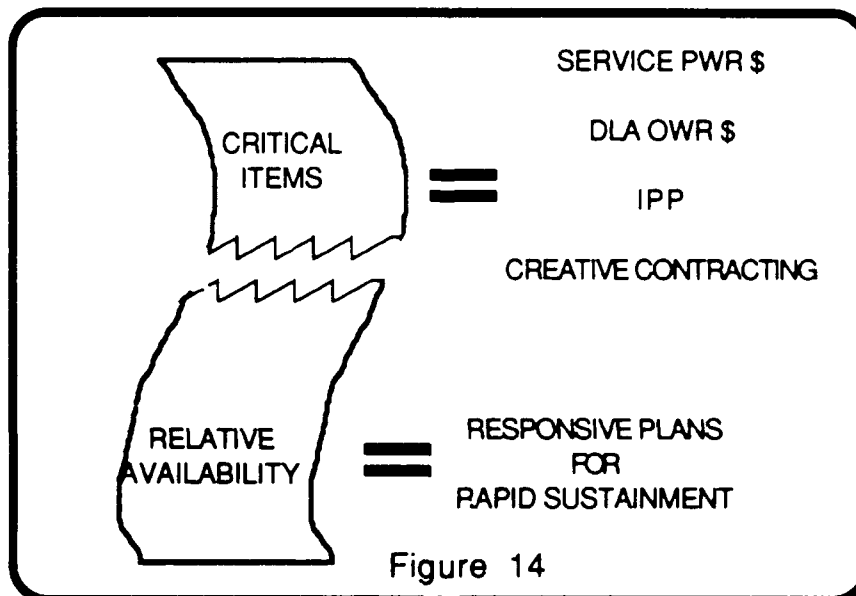


Previous discussion has shown the ability to profile wartime requirements in a time phased manner. When wartime requirements are viewed in comparison to the total number of consumable items, the percentage of items requiring intensive management is not that great. By the use of market analysis or the IPP process, DLA has the basic ability to determine item relative availability. When coupled with the GMR philosophy, requirements could be portrayed to industry in a logical form. Figure 13 illustrates this concept. This basic example shows how



production can be increased to meet projected surge quantities and even surpass total demands. Of interest is the fact that the Defense Authorization Act of 1989 requires the Under Secretary of Defense for Acquisition to identify and plan for the procurement of items of supply that are suitable substitutes or are commercially available from domestic sources to meet surge and mobilization requirements.³⁹ This guidance implies the inclusion of consumables.

Incorporating relative availability as a preliminary stage in the ISI automation process could provide a product useful to the Armed Services, the industrial planner, and the contractor. Figure 14 depicts the rank ordered list from the ISI. Those items that are relative available from



industry would not be candidates for industrial planning but could be programmed for rapid contracting from known sources of supply. In fact,

surge options could be negotiated with current and planned alternate producers. Items not relatively available would be considered critical and in need of industrial planning. Additionally, the critical item list would show the Armed Services and DLA where to best invest their limited PWR and OWR dollars.

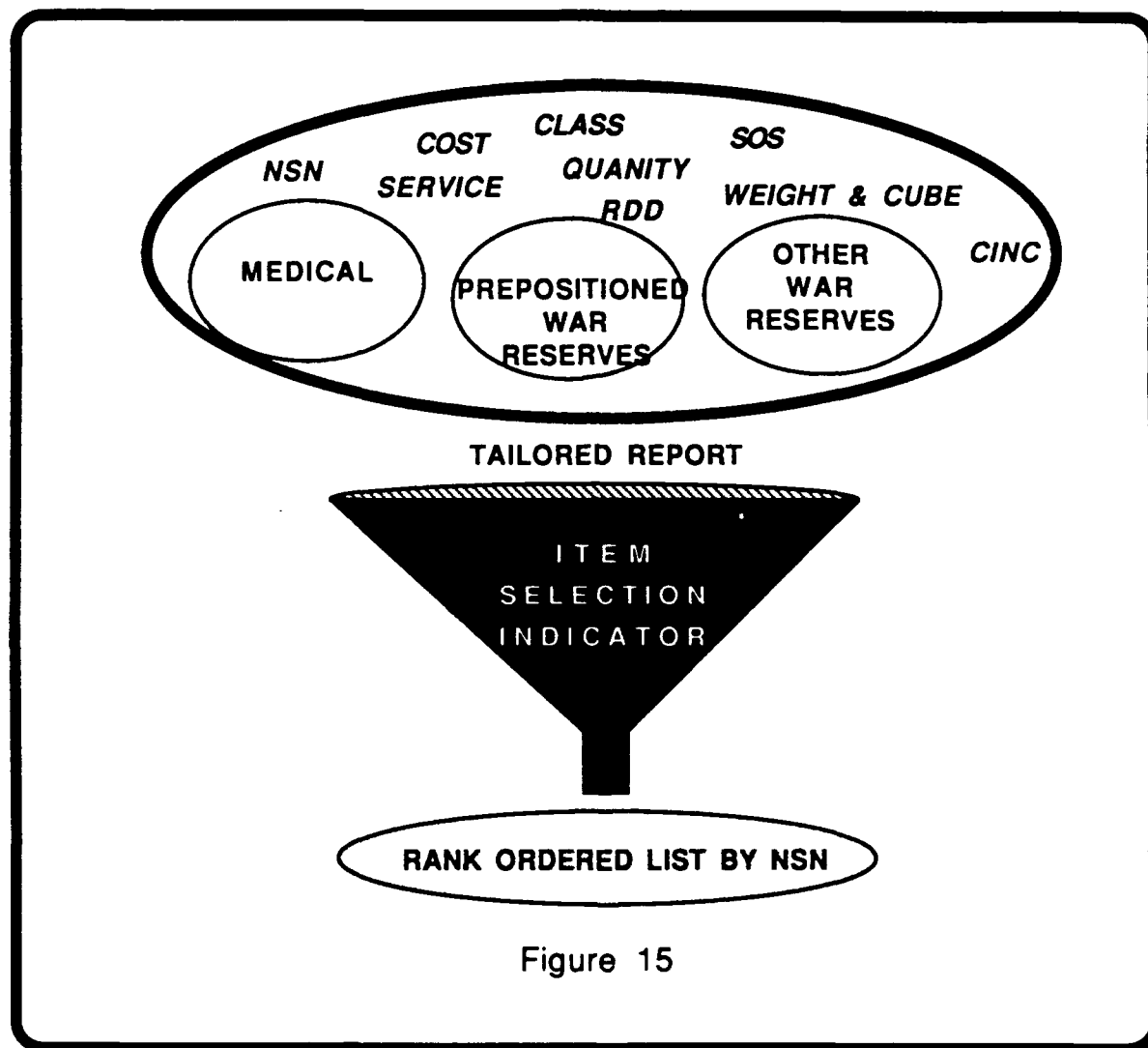
Timely obligation of new contracts will be a significant problem in a surge or mobilization. The current contracting process places emphasis on competition, procurement decisions, and compliance with policy. The use of letter contracts, option clauses and basic ordering agreements are techniques to accelerate deliveries during surge or mobilization, particularly for the items that are relatively available. None of these techniques can bypass delays and approvals required by law. However, they can be used effectively to accelerate the process if plans are made in advance and effective IPP has been conducted to ensure that contractors have the capability to meet the agreed production rates. While accelerating the contracting process cannot increase the surge or mobilization capacity, the lack of accelerated procedures will only delay meeting the surge or mobilization rates. Any effort to resolve contracting bottlenecks in peacetime can be extremely cost-effective in comparison to other pre-crisis investments.

Recommended Changes in Planning

As discussed, there are a myriad of variables in motion which directly effect the planning of consumable items with industry. The changing geopolitical environment, a reduced force structure, and an austere budget impact Service requirements which are passed to the wholesale community. DMRDs are reorienting the mission and scope of the DLA. Integrated materiel management procedures, including enhanced automation techniques, will improve internal wholesale business practices. But the most significant elements of ongoing change exist within the relationship between industry and DOD. GMR is the philosophy which must surround DOD's association with a diminishing industrial base.

Within the wholesale environment, flexibility to meet Service requirements must be the driving element for improvement. A random access data base for requirements should be created. This data base, operated on a micro computer would include all Service requirements (mobilization, PWR, and OWR) and have the elasticity to incorporate numerous planning factors to tailor specific reports. Planning elements should include: unit cost, quantity, stock number, class of supply, source of supply, required delivery date, service and theater applicability, and

weight and cube. This requirements data base, incorporated with the ISI, would provide tailored reports to meet specific needs. Figure 15 depicts this concept. For example, if the logistics planner needs to know what



Class IX parts would be required by the Army for the first ten days of a scenario in SOUTHCOM, a report could be generated. Placing this product in the ISI would give the planner a rank ordered list for budget and industrial planning. Additionally, the theater could be provided proactive

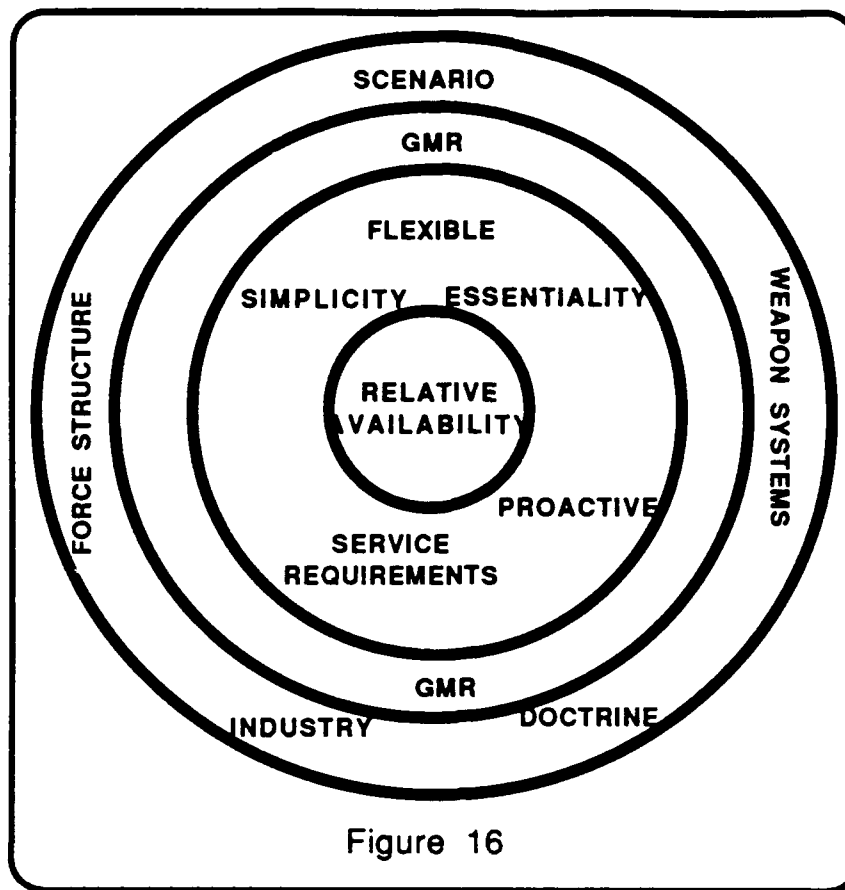
guidance for earmarking logistics bottlenecks, developing solutions, and testing results during exercises.

Integrating products described above with the concept of COPS, requirements could be grouped for planning. This "family group" of combat essential surge and mobilization requirements could be packaged for IPP and contracting. Surge and mobilization requirements for critical items, as well as those that are relatively available, could be negotiated at the same time as the COPS IDTC via an option clause, letter requirement or basic procurement agreement. Not only does the wholesale logistician save time and money, but the degree of efficiency is intensified. The vendor knows what is expected and is able to plan to meet surge and mobilization. In fact, the vendor will be holding the inventory and possibly eliminating second and third destination transportation costs. Placing this idea in the world of EDI, a paperless operation could exist. What the IPP planner would see would be only the critical items requiring the human touch. These items would probably be characterized as long lead, sole source, low density, military specific products.

CONCLUSION

Change is a constant that surrounds the ability to plan for the sustainment of forces. Effective industrial planning for consumable items is a concept which enhances DOD's objectives to deter war and win should war occur. The resources to support this concept need to be adjusted and refined to meet elements of change: doctrine, industry, force structure, weapon systems, and contingency scenarios. The strategy for the wholesale community must be one that is flexible, proactive, simple and responds to combat essential Service requirements. At the core of this strategy is the relative availability of industry to respond to surge and mobilization. But this strategy is encircled by the GMR philosophy. Figure 16 is a model for this strategy.

Much work needs to be accomplished to integrate the ideas presented. However, the most significant challenge to the wholesale community is a cultural alteration of materiel management business practices. Item cost alone cannot be the single criteria for DOD and industrial relations; the total cost of item management compared to the value the item plays in meeting surge and mobilization needs must be



considered. Merging industrial preparedness into common wholesale business practices is an inexpensive tool to ensure sustainment of forces in combat. While the Armed Services know their requirements, it is up to the DOD and industry team to verify sustainment and inform the Armed Services of not only the problem areas but the solutions.

ENDNOTES

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3. Ibid., p. 4.
4. Office of the Assistant Secretary of Defense for Production and Logistics, Assessing Sustainability: The Report of the Sustainability Assessment Task Force, p. vi.
5. David C. Morrison, "Halting the Erosion," National Journal, July 1988, pp. 1968.
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7. Ibid.
8. Interview with Carol Morris, GM 15, Defense Logistics Agency (DLA-OSR), Cameron Station, Virginia, 7 December 1990.
9. Ibid.
10. Office of the Assistant Secretary of Defense for Production and Logistics, p. 33.
11. Interview with Franz X. Fritton, GM15, Defense Logistics Agency (DLA-DSSO), Cameron Station, Virginia, 15 January 1991.
12. Ibid.
13. Ibid.

14. Interview with Sue Jones, GS 14, Defense Logistics Agency (DLA DSAC), Columbus, Ohio, 1 June 1989.

15. Interview with Charles Morrison, GM15, Defense Logistics Agency (DLA-LL), Cameron Station, Virginia, 15 January 1991.

16. Fritton.

17. Ibid.

18. Jones.

19. Ibid.

20. Paul E. Tabil, Graduated Mobilization Response: A Key Element of National Deterrent Strategy, p. ii.

21. Ibid.

22. Ibid., p. 4.

23. Ibid., p. 14.

24. Committee On Graduated Mobilization Response Manufacturing Studies Board, National Research Council, Graduated Mobilization Response: Forging A Strong Partnership With Industry, p. 18.

25. Office of the Assistant Secretary of Defense for Production and Logistics, p. v.

26. Ibid., p. vi.

27. Office of the Joint Chiefs of Staff, Joint Strategic Capabilities Plan: Annex B, p. III- 1.

28. Interview with Jonathan McMillian, GS14, Defense Logistics Agency (DLA-ESOC), Cameron Station, Virginia, 9 June 1989.

29. Interview with Nancy Johnson, GS14, Defense Logistics Agency

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30. Office of the Assistant Secretary of Defense for Acquisition and Logistics, An Industrial Mobilization Handbook for Government, p. xii.

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33. Interview with Hugh Bradley, GM14, Defense Logistics Agency (DLA-PP), Cameron Station, Virginia, 19 December 1990.

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35. Ibid., p. 7.

36. Kurt F. Schwartz, DLA industrial Preparedness Program (IPP) Item Selection Indicator, p. ix.

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38. Ibid.

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